MONTANA TEEN DRIVER & TRAINING CURRICULUM

Module 3.1 Effective Vision Control Lesson Plan

Long-term Learning Goals:

1. The learner will know what vision is and how important it is to use it effectively when driving.
2. The learner will know that vision is a process and that it takes time to develop effective vision habits
3. The learner will learn the vehicle control sequence and be able to apply it in different driving scenarios
4. The learner will know risk management habits and know how to develop those habits and attitudes.

Students' Learning Targets:

1. I can describe how vision works and how I see.
2. I can describe how the eyes have to pause briefly to gather information and understand it in the context I am seeing it.
3. I can explain how I perceive my world.
4. I can explain how the brain processes information and understand why it takes time to perceive my world.
5. I can describe three parts of vision and how they are used during driving.
6. I can recall the vehicle control sequence and describe how it can be applied while driving.
7. I can explain how the Find-Solve-Control is used as an integral part of the vehicle control sequence and how it helps me use my vision more effectively.
8. I can identify things that interfere with my vision while driving and I know how to correct them to improve my vision.
9. I know that good habits are integral to my driving success and I know how to develop and apply good habits.

Materials Needed:

1. Module 3.1 PowerPoint Presentation
2. Module 3.1 Fact Sheets (printed for each student)
3. Module 3.1 Teacher Commentary (printed out)
4. Paper

Module 3.1 Activities:

1. Module 3.1 PowerPoint presentation
2. Student-centered activities, including reading, small and large group discussion.
3. Problem-solving teamwork
4. Final Evaluation

TEACHER COMMENTARY

The following are questions you can ask during the presentation to engage students and have them develop key concepts related to Effective Vision Control.

Representation of the module slides are provided to allow you to connect the materials, data, and questions with the presentation.

Slides 2 and 3:

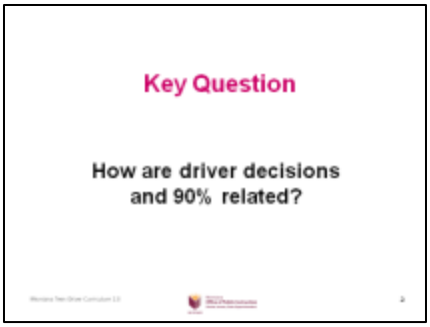
Key Answer: ***90% of driver decision-making is based on visual cues and habits.***

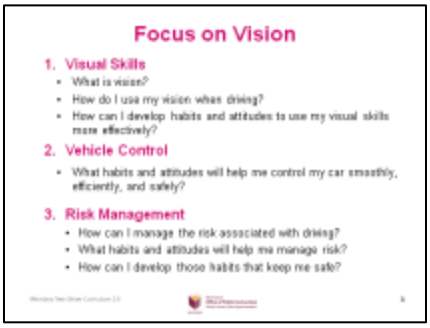
What you should know at the conclusion of this module:

1. Visual Skills important to driving
   a. What is vision?
   b. How you use vision when driving?
   c. What habits and attitudes will help with better vision usage?

2. Vehicle Control
   a. What habits and attitudes will help the driver operate the vehicle smoothly, efficiently, and safely

3. Risk Management
   a. How can I manage the risk associated with driving?
   b. What habits and attitudes will help me manage the risk I will encounter while I am driving?
   c. How can I develop those habits?





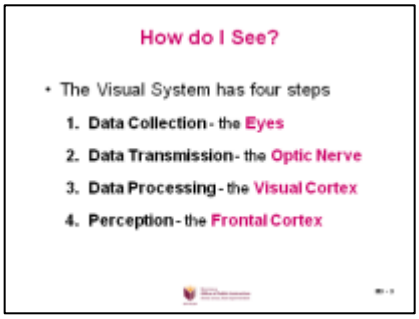
Slide 4:
Activities Overview

- Short Presentations
- Short Readings
- Problem-solving Activities
- Student-centered Activities

Strategies for Effective Vision Control

Slide 5: How do I see?
You may want to ask the following questions.

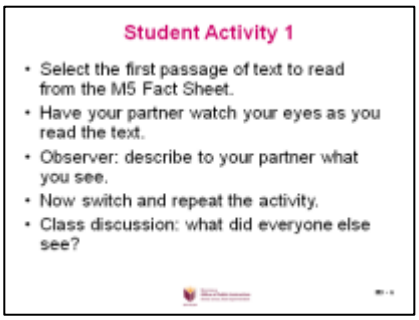
1. What are the parts of vision?
2. How do they work with each other to see?
3. What is the role of the eyes?
4. What kind of data do the eyes collect?
5. How does what I see get to the brain?
6. What does the brain do with the things I see once it gets there?
7. How do I perceive what I have seen so that I can understand what it means in the context of my world?

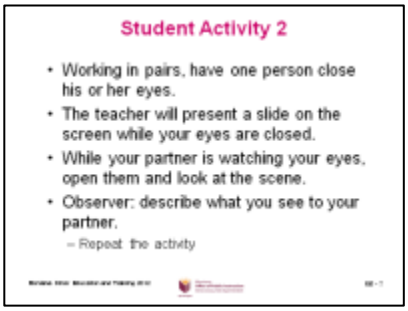


Read the *Vision Control Fact Sheet* to gain a fuller understanding of visual processing and perception.

Slides 6-7:
The next 4 slides are the first and second student activities. Students will have the opportunity to simultaneously read a passage and have an observer watch their eyes in the first activity and in the second they will watch their partner's eyes as they scan a picture of a winter driving scene and a vehicle dashboard.

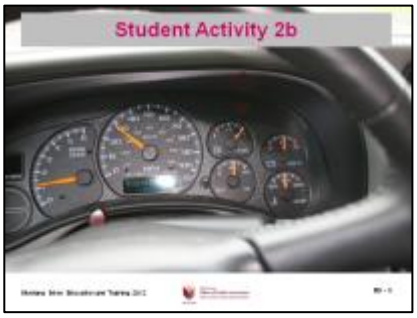
The directions are pretty clear in the presentation so there is no need to repeat the directions.





Slides 8-9:
Student Activities 2a and 2b

Students will have the opportunity to simultaneously read a passage and have an observer watch their eyes in the first activity and in the second they will watch their partner's eyes as they scan a picture of a winter driving scene and a vehicle dashboard.



Slides 10-11: Vision is a Process
Reading Activity: Paragraphs 2 and 3 of the Vision Control Fact Sheet.

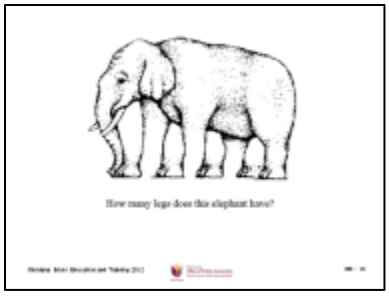
Introduction to vision as a process. The Vision Control Fact Sheet describes how vision works and how each part works together to help us see our world.

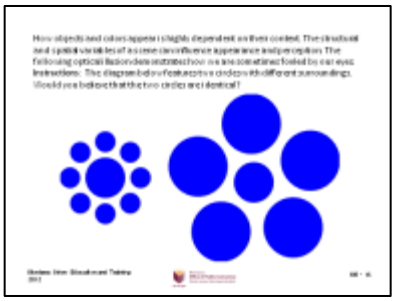
Emphasis: Vision is a process that takes time because we have to mentally process the data our eyes deliver to the brain. At a minimum, it takes 3/10 of a second to actually see and perceive an object.

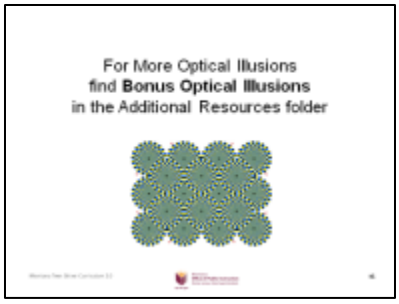
Slides 12-16: PERCEPTION

Perception takes time because it must be processed in the brain. Optical illusions work because the picture presents data that the brain interprets as something that does not exist.

Open the **Bonus Optical Illusions** file in the Additional Resources folder to show students 50 more optical illusions. Ask if they can know how they work.

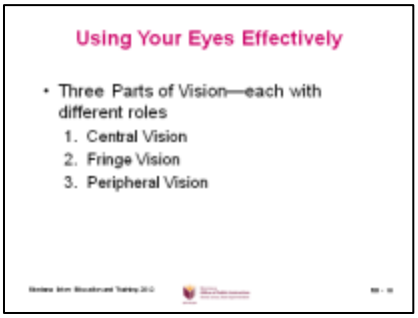






Slide 17: Using your eyes effectively

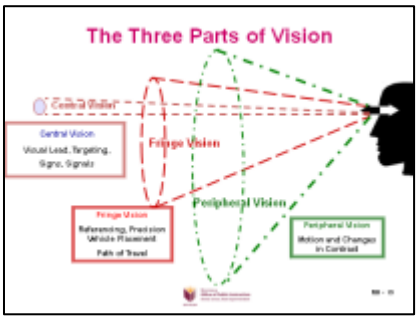
In order to see effectively we need to understand how to use our eyes to their fullest to gather information.



Vision is divided into 3 parts.

1. The central vision is the area of the eye that sees about 3-5 degrees of vision. A part of the retina called the fovea has the highest concentration of cones (color sensing nerves) and provides the best clarity and color vision. When we really want to see something clearly we look directly at it with our central vision.
2. The fringe vision is the area that surrounds the central vision and is about 30-40 degrees of our visual field. We see less detail but we can gather a tremendous amount of information about our world.
3. The peripheral vision is the area that is at the edges of what we can see. It is about 170 degrees of our visual field. We see the least amount of detail with this visual area but it gives us information at the edges of our vision. We use our peripheral vision to detect motion and to see changes in shapes and contrast.

Slide 18: The Three Parts of Vision

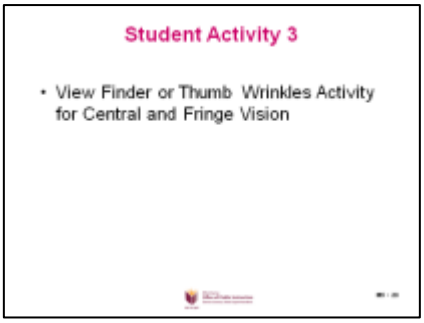


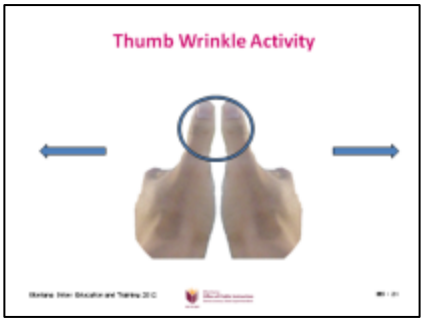
Central Vision
We use Central Vision to see our target, provide a visual lead, and read signs and signals.

Fringe Vision
We use Fringe Vision to see reference points for precision vehicle placement. It also helps us see our path of travel as we look to our target with our Central Vision.

Peripheral Vision
We use our Peripheral Vision to see motion, changes in shape and changes in contrast at the edge of our vision. We see things like the car coming up to the intersection as we are going through it. Movement in our outside mirrors is picked up with our Peripheral Vision and that causes our head to turn to see what's there.

Slides 19-20





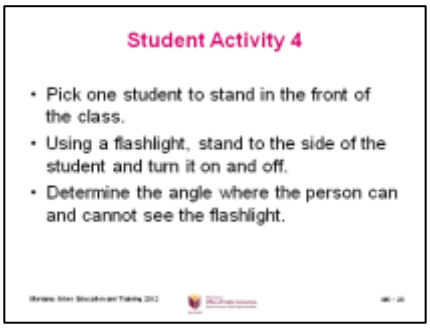
Student Activity 3
Thumb Wrinkle Activity

1. Hold your hands out at arm's length with your thumbs pointing up like you see in the slide.
2. Look at your thumb wrinkles with your central vision and see the detail of your thumb wrinkles.
3. Slowly separate your hands while still looking straight ahead. Stop moving your hands when the detail of your thumb wrinkles disappears but you can still see your thumbs. That is the edge of your Fringe Vision.

Slide 21 Student Activity Okee-Dokee, part two. 1. Make the OK sign with your index finger and thumb. 2. Hold that out at arm's length and look at a target (door knob, mark on the dry erase board or something similar) 3. That symbolizes your central vision. 4. Pull your hand back and place the OK sign on your face like one side of a pair of glasses and continue to look at your target. What you see is your fringe visual field.	
Slide 22 The yellow circle represents seeing the target with your central vision. The tan represents what you see with your fringe vision. Look at your target and see how much you can see with your fringe vision. 1. Can you see the roadway? 2. Can you see the white and yellow lines? 3. Can you see the oncoming cars? 4. Can you see the bicyclist?	
Slide 23 Watch the video with your eyes fixed on the target and see how much information you can gather by watching the video.	

Slide 24

Student activity. This activity is intended to help the student see just how wide their peripheral vision is.



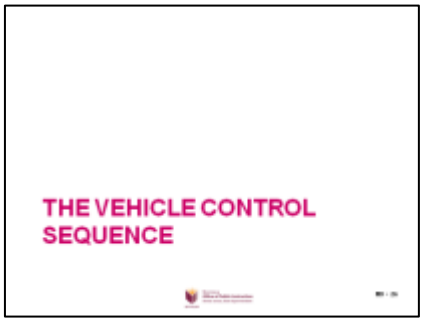
Slides 25 and 26

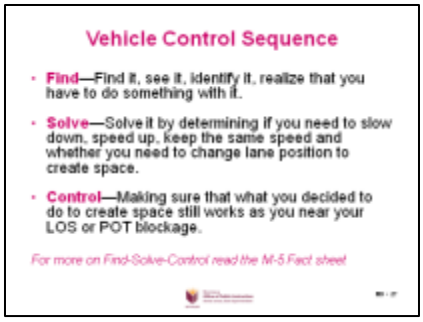
Ninety per cent (90%) of the decisions I make while driving are because of what I see. The vehicle control sequence of Vision, Motion and Steering Control happens because I first:

Find the LOS or POT blockage.

Solve the blockage by changing my lane position and speed and I communicate my intentions.

Control: I make sure that my solution still works.



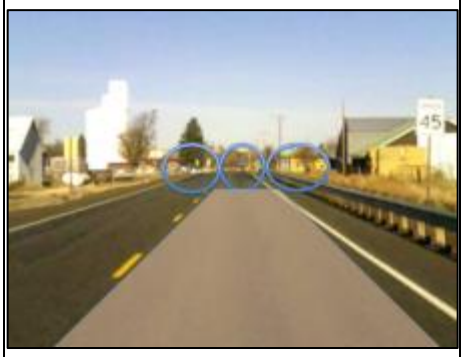


Slides 27-28

These slides show the student the four-step searching process.

Let the slide animate on its own.

Search to the target, the targeting path, left front, and right front. If you back the slide up you can repeat the process and the students can practice it



Slides 29-32

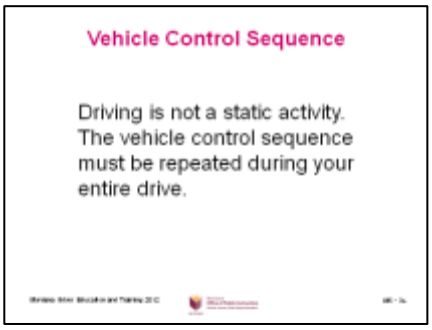
Identify the LOS-POT blockages and then decide what you are going to do with them.

Each slide has the questions on them with the answers at the bottom. This is a good activity for students to work in groups of two or three.

Find • Solve • Control

Slides 33-36

Driving is not a static process. These videos have the student scan a video of a car driving down a street in a neighborhood. The car stops for some reason and while the car is stopped a young boy runs across the street in front of the car.

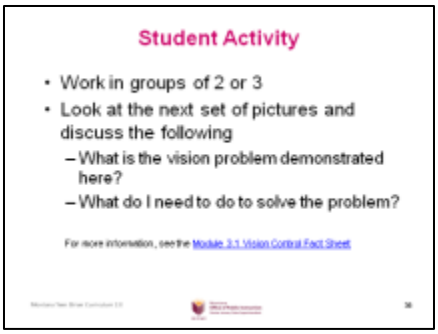


Slide 35 has the discussion question you can ask the students and then repeat the activity by watching the video over again on slide 36.

Slides 37-38

How do I deal with vision issues and how do I solve them? It is a great student-centered activity and lets the students work in groups to:

1. Identify the problem
2. Propose a solution
3. Have a class discussion sharing their outcomes.



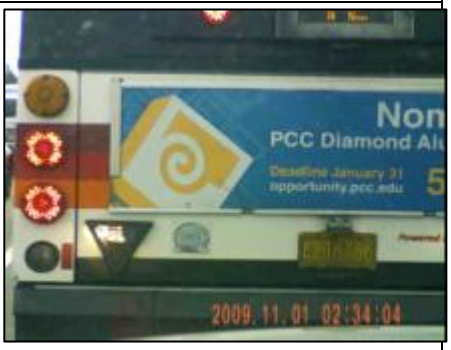
Slide 39

Vision Problem

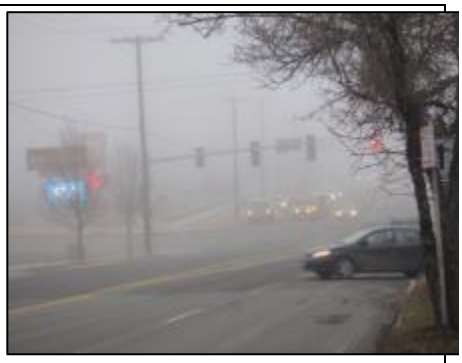
Windshield has streaks of mud and road debris smudged by the wiper blades. Road is wet and will only continue to put water and dirt on my windshield.

Solution

Use windshield washer to clean window. If washer does not clean window, stop and clean it at a service station. Fill the washer reservoir with an antifreeze washer fluid and possibly change the wiper blades.

Slide 40 **Vision Problem** View of the road is blocked by the snow bank and I don't have a clear view of the road to safely turn onto the highway. **Solution** Check your front zone, use your forward reference point to move to the edge of the road and stop. Scan the road for traffic and go when safe.	
Slide 41 **Vision Problem** Stopped bus blocks my view of road ahead. **Solution** Anticipate that a bus with brake lights on is going to stop. If you can, change lanes and open up your LOS. If you can't, make sure to stop far enough behind the bus to see the back tires touching the pavement to open your LOS and to give you room to maneuver around the bus in case the driver is taking a break.	
Slide 42 **Vision Problem** Sun glare makes it difficult to see ahead. **Solution** Anticipate that you will have sunny days in Montana and that you should: clean the windows to reduce glare, have sunglasses handy, use the visor to reduce direct glare and look to the right edge of the roadway to minimize the effect of the glare on your vision.	

Slide 43



Vision Problem
Fog limits my ability to see others and to judge distance effectively. It reduces my color vision and the contrast between the background and the cars and people I am searching for. It also reduces my depth perception and makes things look further away than they really are.

Solution
Clean windows, use your headlights so others will see you, increase following distance, scan more than once when entering traffic and realize that cars may be closer than you think, so allow a little longer space to execute a merge or enter traffic.

Slide 44

Vision Problem
Dust blowing across road is similar to fog. It limits my ability to see very far in the dust storm.

Solution
Clean windows, use your headlights so others will see you, increase your following distance and anticipate that others might stop unexpectedly or turn in front of you.

Slides 45-47

Vision Problem
Frost on the windows. Scraping a small port-hole to see out still limits my vision and spraying water on my windows causes them to freeze and block my view.

Solution
Scrape the entire window and run the defroster on high until the window is clear. Remember that you have to have a complete view of the roadway in order to make informed driving decisions and the risk of hitting someone increases drastically with such limited visibility.

Slide 48

As I increase speed I reduce my ability to gather critical information. It takes time to see because our eyes have to stop briefly to allow the information to be gathered and processed.

That's because I can't move my eyes fast enough to collect all the data that is passing by. I narrow my visual field to avoid developing eye fatigue.

Slide 49

I go 37 feet per second if I travel at 25 MPH. If it takes 3/10 of a second to “see” something then I will travel 11 feet each time my eyes pause to gather information.

I go 105 feet per second if I travel 70 miles per hour. I go 35 feet every time my eyes pause to gather information.

Slide 50

Question: What do you see when you scan this photo which simulates going at a speed of 25 mph?

Slide 51

- Visual field shrinks to the size of the clear area
- Information about other users and LP is less
- Ability to detect LOS and POTs is reduced
- NOTICE HOW MUCH YOU MISS!!!

Slide 52

Summary slide that introduces the idea that good vision control is a result of developing good habits.

Slides 53-54

Describes the process of habit development.

The Habits Fact Sheet covers these principles in detail and would be good homework for students to look over and come to class prepared for a discussion the next day.

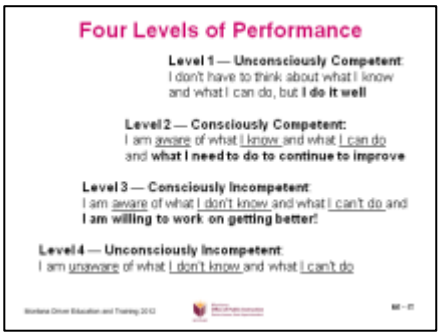
Slide 55

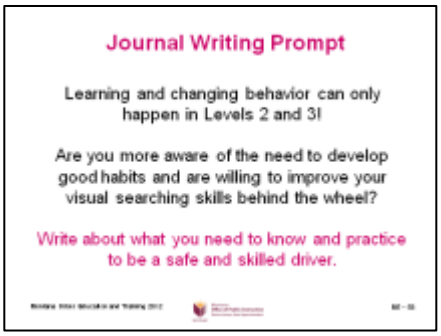
Describes the process of habit development. The Habits Fact Sheet covers these principles in detail and would be good homework for students to look over and come to class prepared for a discussion the next day.

Slides 56-57

All of us drive at some level of performance. Each level is described and questions you may want to ask are:

1. What level do you think you drive at?
2. Where do you think your parents drive at?
3. What levels do you think you are able to learn new ideas, attitudes, and skills? Why do you think that is?
4. What do you want to do with what you have learned today? Do you think you can change your driving even if you have been driving for a long time?
5. If you want to be a good driver, what do you have to do?





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